Standard Operating Procedure

Task: Electrode Polishing
Date: May 29, 2013
Revision Date: May 5, 2016

Background:
- Electrode polishing helps to create a structurally consistent surface to facilitate the acquisition of reproducible data.

Training Requirements:
- Lab safety training
- Electrochemistry training

Potential Hazards:
- None

Special PPE Requirements:
- None

Materials Needed:
- Electrode (glassy carbon, GC, or boron-doped diamond, BDD)
- Polishing kit
    - MicroPolish Powder (0.3 and 0.05 micron)
    - 2-7/8" Mastertex PSA Buehler polishing pads
- Water, methanol, and acetone squirt bottles

Procedure:
- Inspect the surface of the electrode:
    - The electrode surface should look uniformly shiny and reflective.
    - General lack of luster, or patches of grime, grit, or foreign material can usually be addressed with polishing.
    - If the electrode surface is visibly scratched, consult a senior electrochemist in the group.
- Rinse the electrode first with methanol and then with water.
- Prepare the polishing pads:
    - There are two polishing pads, one 0.3 micron powder and one for 0.05 micron powder. Be careful not to cross-contaminate the polishing pads.
    - Add water to each polishing pad to wet the surface.
    - Add a pea-sized scoop more polishing powder to the pads if necessary.
- Polish the electrode:
    - Before beginning an experiment, start by polishing with the 0.3 micron powder.
    - Maintaining a flat contact with the polishing pad, hold the electrode vertically and firmly (but not forcefully) and move the electrode in a figure 8 pattern for 20 seconds.
    - Thoroughly rinse the electrode with water.

- Next, polish with the 0.05 micron powder, using the same technique.
  - Use the 0.05 micron powder/pad for subsequent polishes during an experiment.
- Thoroughly rinse the electrode again with water (if the electrode will be used in organic solution) or acetone (if the electrode will be used in aqueous solutions).

References